

# **Geoscience Australia RNAAC – 2001 Annual Report**

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## **Introduction**

The RNAAC function of routinely processing all stations in the Australian Regional GPS Network (ARGN) continued during 2001. The weekly combined SINEX result files were submitted to the Crustal Dynamics Data Information System (CDDIS). The Australian Surveying and Land Information Group (AUSLIG) was merged with the Australian Geological Survey Organisation (AGSO) in September 2001 to form Geoscience Australia (GA).

## **Station Network**

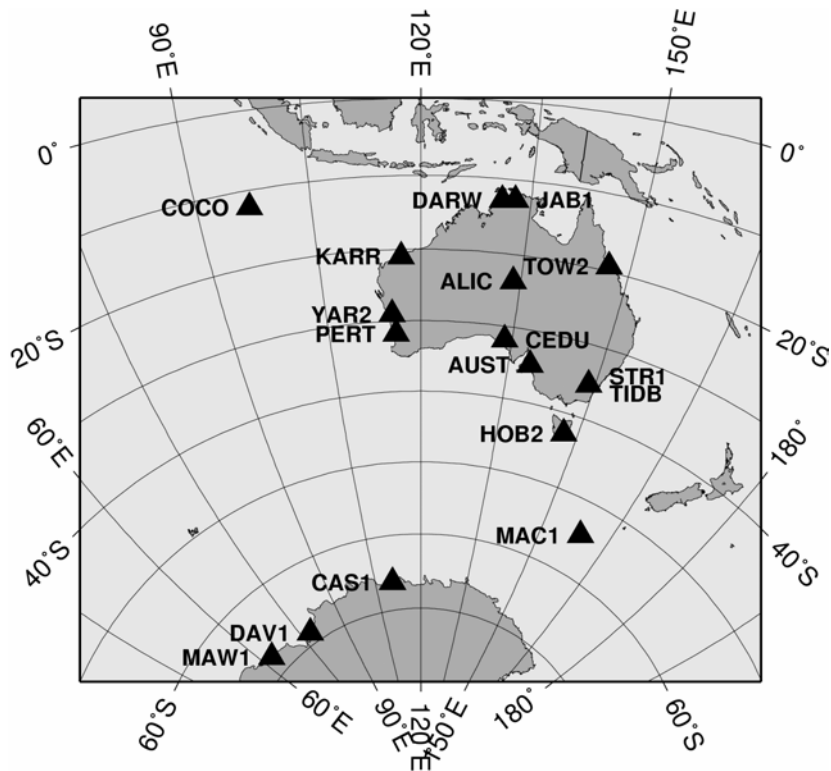
The station network processed by the Geoscience Australia RNAAC as at December 2001 is shown in Figure 1. Fourteen of the seventeen stations in this network are operated by GA. The stations AUST (formerly DST1), PERT and TIDB are owned and operated by other agencies.

Commencing GPS week 1113, data from the Tidbinbilla site was switched from TID2 to TIDB where both GPS receivers are connected to a single antenna. Commencing GPS week 1117, data from the Yaragadee site was switched from YAR1 to YAR2 where both GPS receivers are connected to a single antenna. Commencing week 1143 site DST1 was renamed AUST to conform with the name conventions in the Directory of IERS Stations.

## **Data Analysis and Results**

The Bernese GPS Software version 4.0 was used for the GPS data processing up to and including GPS week 1142. Commencing GPS week 1143 the Bernese GPS Software version 4.2 (Hugentobler, Schaer and Fridez 2001) has been used. Daily solutions were computed using the following strategy:

- L3 double differenced phase observable.
- No resolution of integer ambiguities.
- Elevation cut-off angle of 10° (20° prior to GPS week 1143).
- Elevation dependent observation weighting (commencing GPS week 1143).
- Estimation of tropospheric zenith delay parameters at 2 hourly intervals.
- IGS antenna phase centre variation model applied.
- IGS final orbits and EOPs held fixed.
- Station coordinates for a single station constrained (either TIDB or YAR2).



**Figure 1. Geoscience Australia RNAAC station network as of 31 December 2001**

Seven daily solutions are combined at the normal equation level to obtain the weekly solution output in SINEX format submitted to the CDDIS. These solutions up to and including GPS week 1142 were tightly constrained to the station coordinates from the IGS97 realisation of ITRF97 at the following IGS reference stations; CAS1, DAV1, HOB2, MAC1, PERT, TID2 and YAR1. From GPS week 1143 onwards, the IGS00 realisation of ITRF2000 was used for station coordinate constraint at these seven stations, with TIDB and YAR2 substituted plus CEDU as an additional constraint station.

The Geoscience Australia RNAAC weekly SINEX solution files were included in the GNAAC combination generated by the Massachusetts Institute of Technology (MIT) and the University of Newcastle upon Tyne Polyhedron solutions.

Other GPS data processing and analysis activity at GA include:

- IGS GPS Tide Gauge Benchmark Monitoring Project as a type A analysis centre.
- The South Pacific Sea Level & Climate Monitoring Project.
- Asia Pacific Regional Geodetic Project (annual observation campaigns).
- Australian South West Seismic Zone monitoring project.

## References

Hugentobler, U., Schaer, S. and Fridez, P. (eds.), Bernese GPS Software Version 4.2, Astronomical Institute, University of Berne, 2001.